

We claim:

1. An anneal pyrolytic graphite feedstock material comprising a board of annealed pyrolytic graphite having a thermal conductivity of greater than 1000 watts/m-K, a size in any dimension of at least 5 cm, a thickness of at least 0.2 mm,
5 wherein said board comprises a plurality of flat graphite sheets being parallel to each other and having a flatness of less than 0.075 degrees per mm of thickness.
2. The feedstock annealed pyrolytic graphite material of claim 1, having length and width dimensions of at least 5 cm respectively.
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3. The feedstock annealed pyrolytic graphite material of claim 1, having a thickness of at least 0.5 mm.
4. The feedstock annealed pyrolytic graphite material of claim 1, in the form of a
15 graphitized board of polyimide.
5. The feedstock annealed pyrolytic graphite material of claim 4, wherein said graphitized board of polyimide comprises a plurality of polyimide films having a thickness of less than 50 microns graphitized at a temperature of at least about 2800°C.
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6. The feedstock annealed pyrolytic graphite material of claim 1, in the form of a hot pressed board of pyrolytic graphite.
7. The feedstock annealed pyrolytic graphite material of claim 6, wherein said board
25 of pyrolytic graphite is hot-pressed by heating a stack of layers of plates and pyrolytic graphite sheets at sufficient temperature and pressure for a sufficient period of time to covert said pyrolytic graphite into highly oriented pyrolytic graphite.
8. The feedstock annealed pyrolytic graphite material of claim 7, wherein said board
30 of pyrolytic graphite is hot-pressed by a plurality of graphite plates.
9. A method for manufacturing a feedstock annealed pyrolytic graphite material, the process comprising the steps:
heating one or more sheets of pyrolytic graphite having a size in any dimension of
35 at least 5 cm;

heating and pressing said one or more sheets of pyrolytic graphite superimposed onto a surface of one or more plates at a temperature of at least 2900°C,

thereby forming one or more sheets of annealed pyrolytic graphite comprising a plurality of graphite planes being parallel to each other within at least 0.075 degrees per mm of thickness, having a thermal conductivity of greater than 1000 watts/m-K, a size in any dimension of at least 5 cm, and a thickness of at least 0.2 mm.

9. The method of claim 9, wherein said one or more plates comprise graphite

10. The method of claim 9, wherein said one or more plates are dies.

11. The method of claim 9, wherein one or more sheets of pyrolytic graphite are superimposed onto a surface of one or more plates.

12. A method for forming thermal pyrolytic graphite tiles for the manufacture of heat management devices, said method comprising:

cleaving a board of annealed pyrolytic graphite into separate layers of pyrolytic graphite, said board having has a thermal conductivity of greater than 1000 watts/m-K, a size in any dimension of at least 5 cm, and a thickness of at least 0.2 mm;

machining said layers of pyrolytic graphite into tiles of sufficient dimensions for use in heat management devices;

wherein said board of annealed pyrolytic graphite comprises a plurality of graphite planes being parallel to each other to within at least 0.075 degrees per mm of thickness.

13. An article comprising the thermal pyrolytic graphite tiles manufactured by the method of claim 12.

14. An article comprising the annealed pyrolytic graphite manufactured by the method of claim 9.

15. An article comprising the pyrolytic graphite feedstock material of claim 1.